

Middle Pleistocene Progradational (MPL P1) Play

Angulogerina “B” biozone

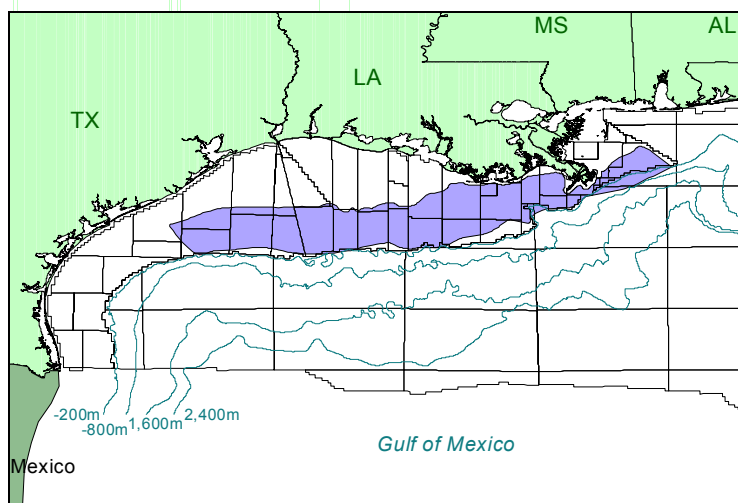


Figure 1. Play location.

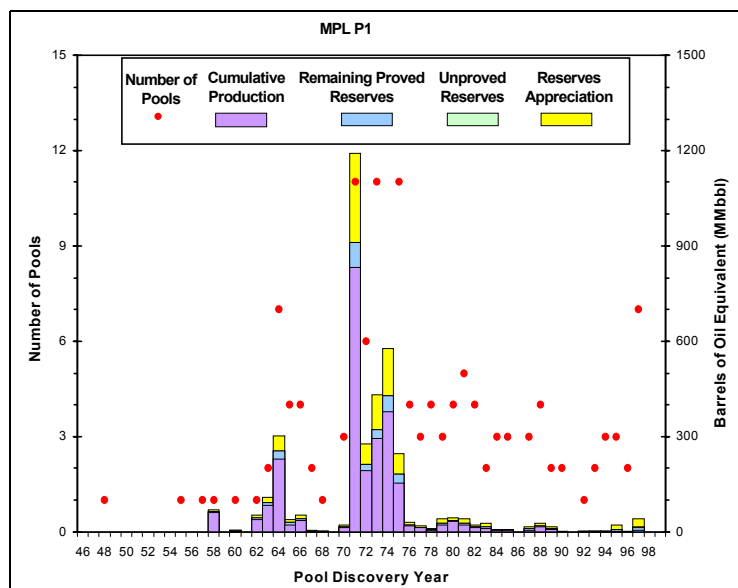


Figure 2. Exploration history graph showing reserves addition and number of pool discoveries by year.

MPL P1 Play				
150 Pools	750 Sands	Minimum	Mean	Maximum
Water depth (feet)		39	197	740
Subsea depth (feet)		2102	5487	11238
Number of sands per pool		1	5	26
Porosity		22%	31%	38%
Water saturation		16%	27%	59%

Table 1. Pool attributes. Values are volume-weighted averages of individual reservoir attributes.

Play Description

The established Middle Pleistocene Progradational (MPL P1) play is the third largest play in the Gulf of Mexico Region on the basis of BOE cumulative production and BOE total reserves. The MPL P1 play occurs at the *Angulogerina* “B” biozone and extends from the Brazos Area offshore Texas to the Main Pass Area east of the present-day Mississippi River Delta (figure 1).

Updip, the play grades into the nearshore sediments of the Middle Pleistocene Aggradational (MPL A1) play and extends onshore into Louisiana near the Mississippi River Delta. To the northeast and west, the play is bounded by a lack of sediment influx at the edges of the MPL depocenter. Downdip, the play grades into the deposits of the Middle Pleistocene Fan 1 (MPL F1) play.

Play Characteristics

Sediments in the MPL P1 play represent major regressive episodes of outbuilding on both the shelf and the slope. In addition, retrogradational reworked sands with a thinning and backstepping log signature locally cap the play. Because these retrogradational sands are poorly developed and discontinuous, they are included as part of the MPL P1 play.

Almost half of the fields in this play are structurally associated with salt diapirs with hydrocarbons trapped on diapir flanks or in sediments draped over diapir tops. Other fields are structurally associated with growth fault anticlines and normal faults, while some fields contain hydrocarbon accumulations trapped by permeability barriers, updip pinch-outs or facies changes. Seals are provided by the juxtaposition of reservoir sands with shales and salt, either structurally (e.g., faulting, diapirism) or stratigraphically (e.g., lateral shale-

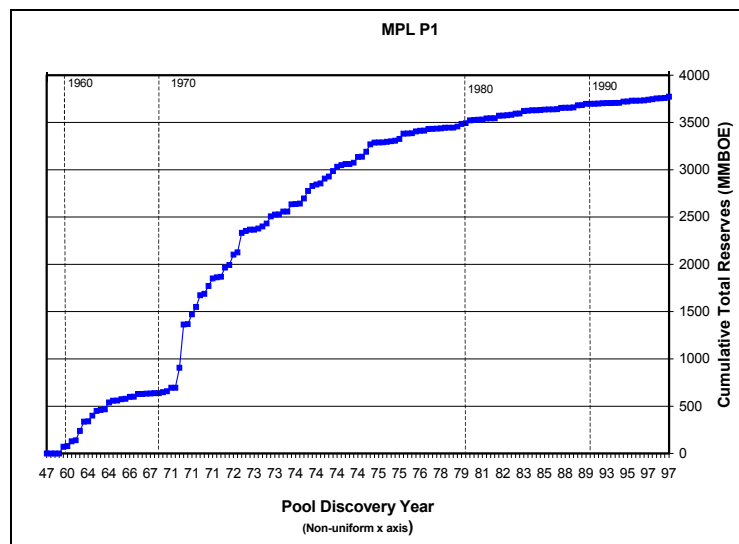


Figure 3. Plot of pools showing cumulative reserves by discovery order. Note the non-uniform x axis.

MPL P1 Play Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
Reserves				
Original proved	148	0.750	11.865	2.862
Cumulative production	—	0.670	10.504	2.539
Remaining proved	—	0.080	1.362	0.322
Unproved	2	<0.001	0.022	0.004
Appreciation (P & U)	—	0.235	3.778	0.907
Undiscovered Conventionally Recoverable Resources				
95th percentile	—	0.049	1.564	0.341
Mean	48	0.078	1.786	0.396
5th percentile	—	0.116	2.012	0.456
Total Endowment				
95th percentile	—	1.034	17.229	4.114
Mean	198	1.064	17.451	4.169
5th percentile	—	1.102	17.677	4.229

Table 2. Assessment results for reserves, undiscovered conventionally recoverable resources, and total endowment.

outs, overlying shales).

Discoveries

The MPL P1 play is a mixed gas and oil play, with total reserves of 0.986 Bbo and 15.665 Tcfg (3.773 BBOE), of which 0.670 Bbo and 10.504 Tcfg (2.539 BBOE) have been produced. The play contains 750 producible sands in 150 pools, and 148 of these pools contain proved reserves (table 1; refer to the Methodology section for a discussion of reservoirs, sands, and pools). The first reserves in the play were discovered in 1948 in the South Timbalier 52 field (figure 2). Almost half of the pools were discovered between 1970 and 1976. Maximum yearly total reserves of 1,193 MMBOE were added in 1971 with the discovery of 11 pools, including the largest pool in the play in the Eugene Island 330 field with 457 MMBOE in total reserves (figures 2 and 3). Pool discoveries before 1990 account for over 99 percent of the play's cumulative production and 98 percent of the play's total reserves, reflecting the maturity of the play. The most recent discovery, prior to this study's cutoff date of January 1, 1999, was in 1997.

The 150 discovered pools contain 1,638 reservoirs, of which 1,093 are nonassociated gas, 402 are undersaturated oil, and 143 are saturated oil. Cumulative production has consisted of 74 percent gas and 26 percent oil.

Assessment Results

The marginal probability of hydrocarbons for the MPL P1 play is 1.00. This play is the eleventh largest in the Gulf of Mexico, on the basis of a mean total endowment of 1.064 Bbo and 17.451 Tcfg (4.169 BBOE) (table 2). Sixty-one percent of this BOE mean total endowment has been produced.

Assessment results indicate that undiscovered conventionally recoverable resources (UCRR) have a range of 0.049 to 0.116 Bbo and 1.564 to 2.012 Tcfg at the 95th and

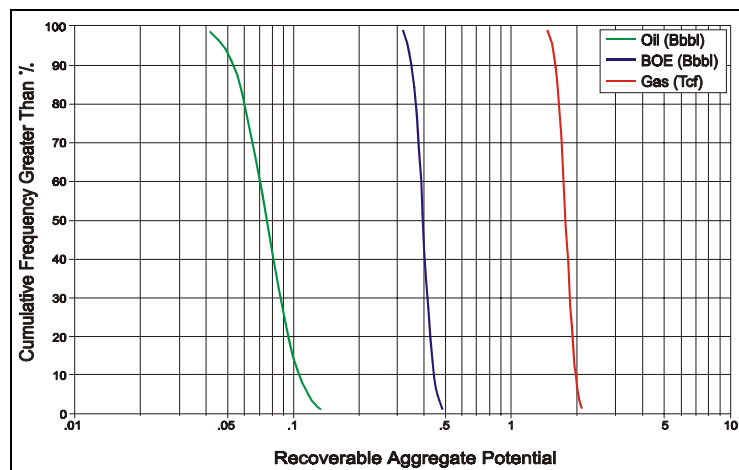


Figure 4. Cumulative probability distribution for undiscovered conventionally recoverable resources.

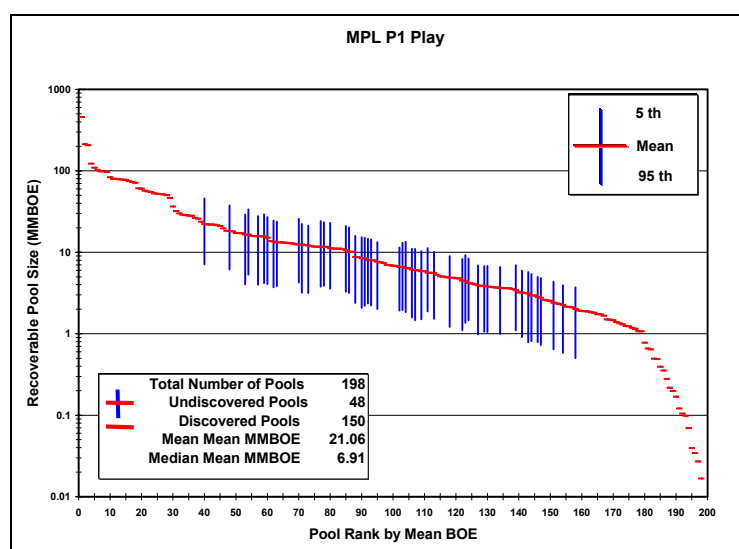


Figure 5. Pool rank plot showing the number of discovered pools (red lines) and the number of pools forecast as remaining to be discovered (blue bars).

5th percentiles, respectively (figure 4). Mean UCRR are estimated at 0.078 Bbo and 1.786 Tcfg (0.396 BBOE). These undiscovered resources might occur in as many as 48 pools. The largest undiscovered pool, with a mean size of 22 MMBOE, is forecast as the 40th largest pool in the play (figure 5). The forecast places the next four largest undiscovered pools in positions 48, 53, 54, and 57 on the pool rank plot. For all the undiscovered pools in the MPL P1 play, the mean mean size is 8 MMBOE, which is substantially less than the 25 MMBOE mean size of the discovered pools. The mean mean size for all pools, including both discovered and undiscovered, is 21 MMBOE.

The MPL P1 is a super-mature play with BOE mean UCRR expected to contribute only 9 percent to the play's BOE mean total endowment. Small pools will continue to be drilled as economics warrant.